What is claimed is:

1. A nano calcium carbonate/vinyl chloride monomer dispersion comprising a vinyl chloride monomer, nano calcium carbonate and a lipophilic dispersing agent.

2. The nano calcium carbonate/vinyl chloride monomer dispersion of claim 1, which further comprises a polymerization initiator.

3. The nano calcium carbonate/vinyl chloride monomer dispersion of claim 1, which comprises 1-30 parts by weight of nano calcium carbonate and 0.01-10 parts by weight of a lipophilic dispersing agent per 100 parts by weight of the vinyl chloride monomer.

4. The nano calcium carbonate/vinyl chloride monomer dispersion of claim 2, which comprises 1-30 parts by weight of nano calcium carbonate, 0.01-10 parts by weight of a lipophilic dispersing agent and 0.01-5 parts by weight of a polymerization initiator per 100 parts by weight of the vinyl chloride monomer.

5. The nano calcium carbonate/vinyl chloride monomer dispersion of claim 1 or 2, wherein the lipophilic dispersing agent is a monomer or polymer compound having a

molecular weight of 40-100,000, which includes a phosphoric acid, a carboxylic acid or a salt thereof.

6. The nano calcium carbonate/vinyl chloride monomer dispersion of claim 5, wherein the salts of the phosphoric acid or the carboxylic acid have an organic side chain selected from the group consisting of sodium, ammonium, primary, secondary, tertiary or quaternary alkyl ammonium salt, C_1-C_{30} hydrocarbons, a homopolymer selected from the group consisting of polyolefin, polyether, polymethacrylate, polyacetate, polyacrylate, polyester and polyurethane, and a copolymer thereof.

7. The nano calcium carbonate/vinyl chloride monomer dispersion of claim 5, wherein the lipophilic polymer has a homopolymer selected from the group consisting of polyolefin, polyether, polymethacrylate, polyacrylate, polyacetate, polyester and polyurethane or a copolymer thereof as a main chain.

8. A PVC based nanocomposite resin composition prepared using the nano calcium carbonate/vinyl chloride monomer dispersion of any one of claims 1-7.

9. A method for preparing a PVC based nanocomposite

resin composition comprising the steps of:

(a) adding nano calcium carbonate and a lipophilic dispersing agent to a vinyl chloride monomer to disperse them;

(b) adding the resultant mixture system to an aqueous solution system comprising deionized water, a suspension stabilizer and a polymerization initiator to prepare a suspension system and polymerizing the suspension system at an elevated temperature to prepare a PVC based nanocomposite resin composition; and

(c) processing the PVC based nanocomposite resin composition including an impact modifier to produce extruded articles.

10. The method of claim 9, wherein the impact modifier is at least one selected from the group consisting of a methyl methacrylate-butadiene-styrene copolymer, an acrylic impact modifier and chlorinated polyethylene.

11. The method of claim 9, wherein each of the nano calcium carbonate and the lipophilic dispersing agent in the step (a) is comprised in 1-30 parts by weight and 0.01-10 parts by weight, respectively, per 100 parts by weight of the vinyl chloride monomer and each of the suspension stabilizer and the polymerization initiator of the step (b)

is comprised in 0.01-5 parts by weight and 0.01-5 parts by weight, respectively, per 100 parts by weight of the vinyl chloride monomer and the impact modifier of the step (c) is comprised in 1-10 parts by weight per 100 parts by weight of the PVC based nanocomposite resin composition.

12. The method of claim 9, wherein the nano calcium carbonate has a particle size of at most 500 nm.

13. The method of claim 9, wherein the lipophilic dispersing agent is a monomer or a polymer compound having a molecular weight of 40-100,000, which includes phosphoric acid, a carboxylic acid or salts thereof.

14. The method of claim 13, wherein the salts of the phosphoric acid or the carboxylic acid have an organic side chain selected from the group consisting of sodium, ammonium, a primary, secondary, tertiary or quaternary alkyl ammonium salt, C_1-C_{30} hydrocarbon, a homopolymer selected from the group consisting of polyolefin, polyether, polymethacrylate, polyacrylate, polyacetate, polyester and polyurethane, and a copolymer thereof.

15. The method of claim 13, wherein the lipophilic polymer has a homopolymer selected from the group

consisting of polyolefin, polyether, polymethacrylate, polyacrylate, polyacetate, polyester and polyurethane or a copolymer thereof as a main chain.

16. The method of claim 9, wherein the suspension stabilizer is at least one selected from the group consisting of vinyl acetate, cellulose and gelatin.

17. The method of claim 9, wherein the suspension stabilizer comprises: a primary suspension stabilizer comprising a polyvinyl acetate having a degree of polymerization of 500-3,000, which has been hydrolyzed to 70-98 mol%, and a modified cellulose having a degree of substitution of 1.0-3.0 and a degree of polymerization of 50-2,000; and a secondary suspension stabilizer comprising a polyvinyl acetate having a degree of polymerization of 500-3,000, which has been hydrolyzed to 10-60 mol%.

18. A method for preparing a PVC based nanocomposite resin composition comprising the steps of:

(a) adding nano calcium carbonate, a lipophilic dispersing agent and a polymerization initiator to a vinyl chloride monomer to disperse them;

(b) adding the resultant mixture system to an aqueous solution system comprising deionized water and a suspension

stabilizer to prepare a suspension system and performing polymerization at an elevated temperature to prepare a PVC based nanocomposite resin composition; and

(c) processing the PVC based nanocomposite resin composition including an impact modifier to produce extruded articles.

19. The method of claim 18, wherein the impact modifier is at least one selected from the group consisting of a methyl methacrylate-butadiene-styrene copolymer, an acrylic impact modifier and a chlorinated polyethylene.

20. The method of claim 18, wherein each of the nano calcium carbonate, the lipophilic dispersing agent and the polymerization initiator of the step (a) is comprised in 1-30 parts by weight, 0.01-10 parts by weight and 0.01-5 parts by weight, respectively, per 100 parts by weight of the vinyl chloride monomer, the suspension stabilizer of the step (b) is comprised in 0.01-5 parts by weight per 100 parts by weight of the vinyl chloride monomer and the impact modifier of the step (c) is comprised in 1-10 parts by weight per 100 parts by weight of the PVC based nanocomposite resin composition.

21. The method of claim 18, wherein the nano calcium

carbonate has a particle size of at most 500 nm.

22. The method of claim 18, wherein the lipophilic dispersing agent is a monomer or polymer compound having a molecular weight of 40-100,000, which includes a phosphoric acid, a carboxylic acid or a salt thereof.

23. The method of claim 22, wherein the salts of the phosphoric acid or the carboxylic acid have an organic side chain selected from the group consisting of sodium, ammonium, a primary, secondary, tertiary or quaternary alkyl ammonium salt, C_1-C_{30} hydrocarbon, a homopolymer selected from the group consisting of polyolefin, polyether, polymethacrylate, polyacrylate, polyacetate, polyester and polyurethane, and a copolymer thereof.

24. The method of claim 22, wherein the lipophilic polymer has a homopolymer selected from the group consisting of polyolefin, polyether, polymethacrylate, polyacrylate, polyacetate, polyester and polyurethane or a copolymer thereof as a main chain.

25. The method of claim 18, wherein the suspension stabilizer is at least one selected from the group consisting of vinyl acetate, cellulose and gelatin.

26. The method of claim 18, wherein the suspension stabilizer comprises: a primary suspension stabilizer comprising a polyvinyl acetate having a degree of polymerization of 500-3,000 and a modified cellulose having a degree of substitution of 1.0-3.0 and a degree of polymerization of 50-2,000, which has been hydrolyzed to 70-98 mol%; a secondary suspension stabilizer comprising a polyvinyl acetate having a degree of polymerization of 500-3,000, which has been hydrolyzed to 10-60 mol%.